insulin was the predominant type and increased from 38% to 48% of patients taking insulin alone or combined with OADs. Patients without prescription claims for T2D medication dropped from 48% to 36%. Overall annual costs/T2D patient rose by $1466, from $13,743 to $15,175, adjusted to 2012 dollars. **CONCLUSIONS:** For patients in this database, T2D incidence rate decreased from 2007 to 2012, but increased pharmacy claims, comorbidity rates and resource utilization expanded the clinical and economic burden of managing T2D.

RESEARCH POSTER PRESENTATIONS - SESSION II

HEALTH CARE USE & POLICY STUDIES
HEALTH CARE USE & POLICY STUDIES – Consumer Role in Health Care

PHP1

ASSOCIATION BETWEEN INFORMAL CAREGIVERS' ASSISTANCE IN MANAGEMENT OF CARE-RECIPIENTS' MEDICATIONS AND THEIR USE OF TRAINING SERVICES-A NATIONAL RETROSPECTIVE STUDY

Noureldin M[1], Murawski M[2], Mason H[2], Hyner G[3], Plake K[1]
[1]*Purdue University College of Pharmacy and Center on Aging and the Life Course, West Lafayette, IN, USA,* [2]*Purdue University College of Pharmacy, West Lafayette, IN, USA,* [3]*Purdue University College of Health and Human Sciences and Center on Aging and the Life Course, West Lafayette, IN, USA*

OBJECTIVES: Approximately 36% of family caregivers help older adults manage medications. Caregivers have an extensive unmet need for information and training, however, the relationship between caregivers' assistance in managing care-recipients' medications and their use of training services is unclear. The objectives of this study are to examine the association between informal caregivers' assistance in managing care-recipients' medications and their a) receipt and b) initiation to seek caregiving-related training. **METHODS:** A retrospective non-experimental study was conducted utilizing data from the National Health and Aging Trends Study (NHATS), and its supplement, the National Study of Caregiving (NSOC). NHATS is comprised of a nationally representative sample of Medicare beneficiaries (≥65 years) while NSOC includes a sample of their informal caregivers. Caregiver assistance in managing care-recipients' medications was assessed using an item asking caregivers if they help keep track of care-recipients' medications. Use of training services was assessed using two items asking if caregivers have received or looked for training to help provide care. Descriptive statistics and logistic regression were performed. **RESULTS:** Fifty four percent of caregivers (N=1367) helped keep track of care-recipients' medications. Approximately 7% indicated they received training and 10.2% reported looking for training. After adjusting for caregivers' education and gender and care-recipients' gender, race, and number of chronic conditions, the adjusted odds of receiving training were 2.58 (95% CI: 1.42, 4.69) fold higher for caregivers who kept track of medications. The adjusted odds of seeking training were 2.29 (95% CI: 1.36, 3.86) fold higher for caregivers who kept track. **CONCLUSIONS:** Results suggest that relatively few caregivers receive or seek training, however, caregivers who manage medications are more likely to have training for their care. Future research should examine the nature of training and how it impacts caregivers' ability to manage medications.

PHP2

PATIENTS SENT TO THE EMERGENCY DEPARTMENT BY ADVANCED HEALTHCARE PROVIDERS ARE MORE LIKELY TO NEED ADMISSION

Groner K[1], Lange CE[1], Davis B[1], Bounds RB[2]
[1]*Christiana Care Health System, Newark, DE, USA,* [2]*Sidney Kimmel Medical College, Philadelphia, PA, USA*

OBJECTIVES: We sought to determine whether admission rates (as a marker for more essential ED utilization) differed based on the type of outpatient provider contact patients experienced prior to their ED visits. **METHODS:** We performed a prospective, cross-sectional survey study of adult ED patients who presented to a single tertiary care referral center. Patients were asked whether they had attempted to contact healthcare providers prior to their visit, what type of provider, whether it was in person or by phone, and what instructions they received. Responses were matched with patient disposition. Those seen by a provider or told by phone to go the ED were considered "sent" to the ED. Others were considered "self-triaged." Patients were considered to have had an "informed" decision to be sent to the ED if they were seen in person or spoke with a physician, as opposed to being sent by a nurse or office clerk. Pearson's Chi-Square testing was used to determine associations between the type of outpatient provider contact and ED disposition. **RESULTS:** There was no difference in admission rate between those sent to the ED (86/166, 51%) and those who self-triaged (134/292, 46%). Patients who received an informed decision to be sent to the ED were more likely to be admitted (59/99, 60%) than others who were sent to the ED (23/61, 38%), $p<0.01$. **CONCLUSIONS:** Patients directed to the ED by a physician were more likely to be admitted than those sent in by other ancillary staff. Admission rate might be one indicator of patient acuity. This indicates that a more informed decision to send patients to the ED may reduce avoidable ED utilization. Therefore, improving patients' access to a physician by phone or expanding acute unscheduled care options for assessments may reduce ED visits that do not require hospital admission.

HEALTH CARE USE & POLICY STUDIES – Diagnosis Related Group

PHP3

THE EFFECT OF DRG-BASED PERFORMANCE- VOLUME LIMIT ON THE ANNUAL BUDGET OF THE CLINICAL CENTRE OF UNIVERSITY OF PÉCS IN HUNGARY

Endrei D[1], Ágoston I[1], Csákvári T[2], Répásy B[1], Molics B[1], Danku N[1], Vajda R[1], Boncz I[1]
[1]*University of Pécs, Pécs, Hungary,* [2]*University of Pécs, Zalaegerszeg, Hungary*

OBJECTIVES: Diagnosis related groups (DRG) like financing method was introduced in Hungary in 1993 for acute care hospital reimbursement. Due to the increased activity of the hospitals, an upper ceiling, the so called performance volume limit (PVL) was introduced in acute care hospital financing in 2006. The aim of our study was to analyze the effect of performance volume limit on DRG based hospital financing on the example of a Hungarian tertiary teaching hospital, the Clinical Centre of the University of Pécs. **METHODS:** Data derived from the financial database of the National Health Insurance Fund Administration, the only health care financing agency in Hungary. We analyzed the annual DRG based health insurance revenues with and without performance volume limit ceiling. We calculated the proportion of hospital activity over that ceiling measured by DRG cost-weights. The period 2007-2013 was involved into the study. **RESULTS:** We found a significant loss in DRG reimbursement due to performance volume limit. The annual loss in DRG reimbursement varied between 2.4-10.5 million USD between 2007-2013. The highest revenue loss was observed in 2009, and after 2009 the financial loss decreased to 7.0 (2010), 5.2 (2011), 3.0 (2012) and 2.8 (2013) million USD. This annual revenue loss represented 3.0-14.9 % of the annual revenues of the Clinical Centre of the University of Pécs. **CONCLUSIONS:** The introduction of performance volume limit into the DRG based hospital financing resulted in a partial loss of hospitals' revenues. The Clinical Centre of the University of Pécs experienced significant loss its revenues due to this regulation.

HEALTH CARE USE & POLICY STUDIES – Disease Management

PHP4

PREVENTABLE HOSPITALIZATIONS AMONG WEST VIRGINIA MEDICAID BENEFICIARIES WITH CHRONIC CONDITIONS

Agarwal P, Bose S, Bias T, Sambamoorthi U
West Virginia University, Morgantown, WV, USA

OBJECTIVES: Hospitalizations for Ambulatory Care Sensitive Conditions also known as preventable hospitalizations can be prevented by proper management in the primary care settings. West Virginia (WV) has highest per person preventable hospitalization cost as compared to other states. The objective of this study is to examine the rates of preventable hospitalizations and patient- and county-level factors that may be associated with preventable hospitalizations among Medicaid beneficiaries with chronic conditions in WV. **METHODS:** Longitudinal dynamic cohort design with baseline and follow-up years was used. Patient-level data were obtained from 2007-2010 Medicaid claims files and county-level data were derived from the Area Health Resource File for WV. The study population included non-elderly inpatient users with selected chronic conditions and 24-months continuous fee-for-service enrollment in Medicaid and not enrolled in Medicare (n=2,938). The dependent variable was any preventable hospitalization in the follow-up year and these were identified using the Prevention Quality Indicator software developed by the Agency for Healthcare Research and Quality. All patient-level (e.g. demographic characteristics, healthcare utilization, and care continuity) and county-level factors (e.g. county level of healthcare infrastructure) were measured during the baseline. Chi-square tests and logistic regressions were used to determine the association between patient- and county-level factors and preventable hospitalizations. **RESULTS:** In this study population 65% were women, 96.3% were whites; 18.5% had any preventable hospitalizations; 12.2% had chronic and 7.2% had acute preventable hospitalizations. A higher percentage of adults in the age group 35-44 had any preventable hospitalization (22.2%) compared to adults in the age-group 25-34 (14.0%). The results from multivariable analysis suggest that patients living in the counties with higher income were less likely to have acute preventable hospitalizations [AOR=0.48, 95% CI (0.28, 0.83)]. **CONCLUSIONS:** Economic climate in WV counties may impact the risk of acute preventable hospitalizations.

PHP5

PREPARATION OF A DATASET FOR ANALYSIS TO DEVELOP A PREDICTOR ALGORITHM FOR DISEASE STATE MANAGEMENT

Lovett AW[1], Chaturvedula A[2], Mukherjee K[2], Brar A[2], Tamhankar N[2]
[1]*Mercer University, Atlanta, GA, USA,* [2]*GVK Biosciences, Hyderabad, India*

OBJECTIVES: The purpose of this study is to provide a source document in the creation of a dataset for analysis to develop a predictor algorithm for disease management. **METHODS:** A review of the literature was performed to determine best practices in the development of a dataset to design a predictor model. Algorithms improve applicability across health settings to meet various disease management aims. Peer reviewed articles and reports were retrieved from the published literature from 2004 to 2014. To summarize results a case study is also provided related to the need for a patient to enroll in a disease state management program based on predicting their chance to have a heart attack. **RESULTS:** Results revealed a total of 33 articles and reports. A summary of this information is provided as a step-by-step guide on how to setup a dataset to predict disease state management patient outcomes. The purpose of data collection should be discussed in detail (e.g. collection of data to identify high risk members). Using predictive modeling tools, data can be synthesized such as diagnoses, hospitalizations, emergency room encounters, expenditures and demographics to develop individualized risk profiles. The assessment period and outcomes of interest should be clearly defined followed by an analysis of model sensitivity and specificity. Members are assigned a chronic illness intensity index score based on these factors. Once scored, members are filtered through clinical criteria that prioritize individuals with clinically manageable conditions. The resulting list represents those members with the most acute and complex illness burden. **CONCLUSIONS:** Findings from this study have implications for clinical care, patient outcomes, research, and policy. Many patients are not receiving appropriate preventive care, lack recommended care and receive contraindicated care. An increase in the creation of databases to be used effectively to develop predictor models is needed to intervene early in the disease cycle.

PHP6

DISPARITES IN PATIENT RESPONSE TO POTENTIAL ADVERSE DRUG EFFECT

Ning N[1], Lu Y[2], Gascue L[1], Ding Y[1], Joyce G[1]
[1]University of Southern California, Los Angeles, CA, USA, [2]Harbor-UCLA Medical Center, Torrance, CA, USA

OBJECTIVES: This research aims to examine whether minority and/or low-income patients are slower to stop use of a particular medical treatment when there is new evidence of safety risks. **METHODS:** We examine the demand response of 11 chronic medications that received first-time major safety warnings (including black box warnings) from the Food and Drug Administration (FDA) between July 2006 -- December 2009. We restrict the sample to medications that experienced decreased utilization post-warning and followed patients who were users of at least one of the 11 medications. Selected Medicare beneficiaries were 18 years or older (n = 549,645), drawn from a random 20% sample of Medicare Part D claims data. A pooled multivariate logistic regression was performed on the likelihood of these patients stopping use post warning (defined as having no claims of the medication between 180 -- 360 days post warnings), controlling for patient demographics, Medicare plan type, new user status (naive patients or not), medication and state fixed effects. **RESULTS:** Preliminary analyses suggest that Hispanics and blacks were more likely to stop taking a medication compared to whites (ORs=1.160 and 1.122, respectively, p<0.001). By contrast, Medicare beneficiaries eligible to receive medications at little or no cost, i.e. dual-eligibiles and those who received low income subsidies, were less likely to stop than non-subsidized beneficiaries (ORs = 0.790 and 0.792 respectively, p<0.001). Users who initiated their medications within 6 months before the safety warnings were the most likely to stop use in the post-warning period (OR = 3.759, p<0.001). **CONCLUSIONS:** The findings suggest that socio-economic status is associated with modestly longer delays in stopping drug therapy with recent medication safety warnings. Specifically, low-income patients who are subsidized beneficiaries are less likely to stop using medications that received safety warnings and therefore may be subject to greater harm from adverse drug effects.

PHP7

PATIENT AWARENESS AND USE OF MEDICATION GUIDES

Walton A[1], Paul K[2]
[1]United BioSource Corporation, Blue Bell, PA, USA, [2]The Corvallis Group, LLC, Summit, NJ, USA

OBJECTIVES: Medication Guides are patient-directed, Food and Drug Administration (FDA)-approved labeling intended to provide risk and safe-use information for prescription medications in easy-to-read, lay language. They were introduced to help patients understand and manage risks and maximize benefit from products by aiding in decision-making and helping improve adherence to and appropriate use of medications. This review was designed to assess whether patients are receiving medication guides per federal regulations and are able to use them as intended. **METHODS:** Knowledge, Attitudes, and Behavior (KAB) survey results in a heterogeneous sample of FDA-mandated REMS were reviewed to assess understanding of key risk messages (KRM) and receipt, reading, and understanding of medication guides. Results were calculated individually and compared across surveys. **RESULTS:** The review includes results from 36 patient KAB surveys for products in 8 therapeutic areas. Sample sizes ranged from 10-628 respondents per survey. Receipt: Median 89.3% (range 58.1-99.6%) of respondents reported receiving a medication guide. Reading: Median 93.1% (range 77.0-100.0%) of respondents reporting receiving a medication guide reported reading at least some of it. Understanding: Median 93.7% (range 36.8-100.0%) of respondents reported understanding all or most of what they read in the medication guide. Median 98.3% (range 64.6-100.0%) of respondents reported they understood all or most of what they read after having someone explain the information. In an objective assessment of understanding KRM of medication guides, median 72.4% (range 1.2-100.0%) of respondents answered questions correctly. **CONCLUSIONS:** This review demonstrates the inconsistency of usability of medication guides for the purposes intended as shown by the range of responses, particularly objective assessment of KRM understanding. Usability may be limited by incomplete distribution and inadequate risk communication. Data will be presented to discuss differences in reported and demonstrated understanding and possible reasons why patients may be unable to use medication guides as they are intended.

PHP8

PERCEPTIONS OF COMMUNITY PHARMACISTS ABOUT THEIR CURRENT PROFESSIONAL ROLE, INTER PROFESSIONAL LEARNING AND CONTINUE PROFESSIONAL DEVELOPMENT IN PAKISTAN

Iqbal MS[1], Iqbal MZ[2], Iqbal MW[3], Ping NY[4], Bahari MB[4]
[1]Faculty of Pharmacy, Bahauddin Zakariya University, Multan, Pakistan. Department of Clinical Pharmacy & Pharmacy Practice, Faculty of Pharmacy, AIMST University, Kedah, Malaysia, [2]Department of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia, Pulau Pinang, Malaysia Department of Clinical Pharmacy & Pharmacy Practice, Faculty of Pharmacy, AIMST University, Kedah, Malaysia, [3]Faculty of Law, University of Malaya, Kualalumpur, Malaysia, [4]Department of Clinical Pharmacy & Pharmacy Practice, Faculty of Pharmacy, AIMST University, Kedah, Malaysia

OBJECTIVES: To investigate community pharmacists' perception towards inter professional learning (IPL), continue professional development (CPD) programs and their current clinical and professional role towards patient care in Pakistan's health care system. **METHODS:** This study was conducted on community pharmacists from different cities of the biggest province of Pakistan, the Punjab. Data was collected by convenient sampling method from all major cities of the province. Different statistical tests were used to analyze the obtained data. **RESULTS:** Around 93.9% of the community pharmacists were involved in prescription filling, refilling and patient counseling in the Punjab, Pakistan. They all were willing to take part in IPL, CPDs and patient safety programs but majority of the pharmacist (82.8%) conveyed that their current role is more focusing towards the store manager, buying and selling of the medicines and inventory control. Surprisingly, 75% of them were not aware about IPL and CPDs. **CONCLUSIONS:** The findings from this study suggest that the community pharmacists in Pakistan do have concerns regarding their present clinical and professional role. Besides, this study also suggested that community pharmacists need to be more proactive and professional in collaboration with other health care professionals.

PHP9

KNOWLEDGE, ATTITUDE AND PERCEPTIONS OF HOSPITAL PHARMACISTS TOWARDS PHARMACISTS LED INTERVENTIONS TO REDUCE ADVERSE DRUG REACTIONS, DRUG INTERACTIONS, AND PHARMACEUTICAL CARE ISSUES TOWARDS BETTER PHARMACEUTICAL CARE PLANNING: A QUALITATIVE INSIGHT FROM PAKISTAN

Iqbal MS[1], Iqbal MW[2], Iqbal MZ[3], Akhtar N[4], Ping NY[3], Bahari MB[3]
[1]Faculty of Pharmacy, Bahauddin Zakariya University, Multan, Pakistan. Department of Clinical Pharmacy & Pharmacy Practice, Faculty of Pharmacy, AIMST University, Kedah, Malaysia, [2]Faculty of Law, University of Malaya, Kualalumpur, Malaysia, [3]Department of Clinical Pharmacy & Pharmacy Practice, Faculty of Pharmacy, AIMST University, Kedah, Malaysia, [4]Faculty of Pharmacy, The Islamia University of Bahawalpur, Bahawalpur, Pakistan

OBJECTIVES: To investigate hospital pharmacists' Knowledge, Attitude and Perceptions (KAP) regarding pharmacists-led interventions to reduce Adverse Drug Reactions (ADRs), Drug Interactions (DIs), and Pharmaceutical Care Issues (PCIs) towards better pharmaceutical care planning in Pakistan. **METHODS:** A prospective, cross-sectional and self-administered questionnaire based study was conducted in tertiary care public hospitals in Pakistan. Only registered hospital pharmacists were approached to obtain data regarding their KAP towards pharmacists-led interventions to reduce ADRs, DIs, and PCIs towards better pharmaceutical care planning. All obtained data were analyzed using descriptive and inferential statistics. **RESULTS:** More than two thirds of the hospital pharmacists (75%) rated physicians as the first person to contact in case of any ADRs, DIs, and PCIs. Nevertheless, very poor KAP was observed towards pharmacist's professional role in addressing ADRs, DIs, and PCIs (79%). Unexpectedly, 42% of them were not having appropriate knowledge towards pharmacists' role in addressing ADRs, DIs, and PCIs in PCP (79%). A total of 72.1% reported that they are familiar with the procedure of reporting ADRs. A total of 89.1% of the respondents agreed that safe, effective and patient-centered PCP plays an important role in patient safety and professional healthcare. In multivariate logistic regression, statistical correlations showed that gender and age were the persuasive predictors for the studied model. **CONCLUSIONS:** The findings from this study endorse that the knowledge of hospital pharmacists in Pakistan regarding their role to reduce ADRs, DIs, and PCIs towards better pharmaceutical care planning was not satisfactory. Their attitude towards learning of latest methods and procedures to address ADRs, DIs, and PCIs was satisfactory. However, pharmacists need to be more proactive and professional in playing their professional role towards better patient care.

HEALTH CARE USE & POLICY STUDIES – Drug/Device/Diagnostic Use & Policy

PHP10

TRACKING THE SPONSORING COUNTRY OF INCORPORATION FOR NEW DRUGS APPROVED BY THE US FDA IN THE PERIOD 1980-2014: A TREND ANALYSIS

Alqahtani SS[1], Rodriguez-Monguio R[2], Seoane-Vazquez E[1], Eguale T[3], Zeukeng MJ[4], Szeinbach S[5]
[1]MCPHS University, Boston, MA, USA, [2]University of Massachusetts, Amherst, Amherst, MA, USA, [3]Brigham and Women's Hospital, Boston, MA, USA, [4]University of Geneva, Geneva, Switzerland, [5]Ohio State University, Columbus, OH, USA

OBJECTIVES: We assessed trends in approvals of new molecular entities (NME) and new therapeutic biologic license applications (BLA) in the US in the period 1980-2014 by country of incorporation of the sponsor company of the application. **METHODS:** Regulatory information for NMEs and BLA approved in the study period was derived from the FDA, and the country of incorporation of the sponsor companies at the date of drug approval was extracted from Lexis-Nexis, companies' webpages and financial reports. Drugs were classified using the WHO anatomical therapeutic chemical classification system. Descriptive statistics and chi-square tests were conducted in the study. **RESULTS:** The FDA approved 103 BLA and 866 NME during the period 1980-2014. Five countries had an average of at least 1 BLA/NME approved per year during the study period: US (57.9% of all approvals), UK (10.6%), Switzerland (10.0%), Germany (7.1%), and Japan (3.7%). The percentage of drugs approved by US companies ranged from 65.9% for antiinfectives for systemic use to 38.9% for sensory organs. US companies sponsored a higher number of BLA (76.7%) than NME (55.7%) (p<0.001). Drugs approved by US companies varied from 62.7% in the 1980s, 56.6% in the 1990s, 58.2% in the 2000s, and 53.2% in the period 2010-2014. The therapeutic classes with the largest percentage of approvals for each country of incorporation were: dermatologicals in the UK (27.0% of all approvals), sensory organs in Switzerland (38.9%), respiratory system in Germany (18.4%), nervous system in Japan (9.4%), and genitourinary system and sex hormones in France (6.1%). US companies sponsored a larger percentage of orphan (64.8%) than non-orphan drugs (54.6%) (p<0.001). **CONCLUSIONS:** Approximately 90% of all new drugs approved by the FDA were sponsored by companies incorporated in US, UK, Switzerland, Germany, and Japan, indicating that pharmaceutical R&D is concentrated in a few countries.

PHP12

THE IMPACT OF THE ESSENTIAL MEDICINE POLICY ON PATIENTS' HEALTH CARE UTILIZATION AND COST IN TIANJIN CHINA: A QUASI-EXPERIMENTAL DESIGN

Ding L, Wu J
Tianjin University, Tianjin, China

OBJECTIVES: The Essential Medicine Policy (EMP) was implemented to improve the affordability of medicines and reduce patients' economic burden in 2009 along with the new round of health care reform in China. This study is to evaluate the effects of EMP on patients' health care utilization and spending. **METHODS:** Urban